

IN THE CLAIMS

Please amend the claims as follows:

Claim 1 (Currently Amended): A path search method for detecting ~~respective~~ timings of path components included in a signal received via a multipath propagation path, said method comprising ~~the steps of~~:

a first path search step detecting ~~respective~~ the timings of the path components using pilot symbols of a known phase included in said signal received via the multipath propagation path; and

a second path search step detecting ~~respective~~ the timings of the path components using information symbols that are derived from a signal demodulated according to said timings detected in the first path search step and said pilot symbols of the known phase.

Claim 2 (Previously Presented): The path search method as claimed in claim 1, wherein said information symbols derived from the signal demodulated according to the timings detected in the first path search step are generated by:

despreading said signal received via the multipath propagation path according to said timings detected in the first path search step;

cophasing and summing the information symbols despread according to said respective path timings in a symbol by symbol manner;

demodulating and implementing data decision of said cophased and summed respective information symbols; and

remodulating said data decision signal.

Claim 3 (Previously Presented): The path search method as claimed in claim 2, wherein information symbols satisfying a predetermined condition, of said information

symbols derived from the signal demodulated according to the timings detected in the first path search step, are selected and fed back.

Claim 4 (Original): The path search method as claimed in claim 1, wherein said second path search step is repeated until a predetermined condition is satisfied.

Claim 5 (Original): The path search method as claimed in claim 1, wherein said signal received via the multipath propagation path is transmitted in accordance with a multicarrier code division multiplex system.

Claim 6 (Currently Amended): A channel estimation method for estimating channel variation using pilot symbols by detecting ~~respective~~ timings of path components included in a signal received via a multipath propagation path, said method comprising:

a first path search step detecting ~~respective~~ the timings of the path components using pilot symbols of a known phase in said signal received via the multipath propagation path;

a first channel estimation step estimating the channel variation using the pilot symbols of the known phase, after said first path search step;

a second path search step detecting ~~respective~~ the timings of the path components using the timings detected in said first path search step, information symbols that are derived from a signal demodulated according to said first channel estimation step, and the pilot symbols of the known phase; and

a second channel estimation step estimating the channel variation using the information symbols that are derived from the signal demodulated according to said first channel estimation step, and the pilot symbols of the known phase, according to the timings detected in said second path search step.

Claim 7-8 (Cancelled).

Claim 9 (Previously Presented): The channel estimation method as claimed in claim 6, wherein said first and second channel estimation steps implement channel estimation by combining said pilot symbols of the known phase and pilot symbols included in other packets transmitted from the same transmission source.

Claims 10-14 (Cancelled).

Claim 15 (Previously Presented): The channel estimation method estimation method as claimed in claim 6, wherein said second channel estimation step includes:

compensating for the channel variation in accordance with a result of a first channel estimation of said first channel estimation step and generating tentative data decision information symbols from the compensated information symbols; and

generating information symbols devoid of modulation components said tentative data decision information symbols and implementing a second channel estimation of said second channel estimation step using said pilot symbols and information symbols.

Claim 16 (Previously Presented): The channel estimation method as claimed in claim 15, wherein said generating the tentative data decision information symbol includes a weighting process for weighting said tentative data decision information symbols according to a reliability.

Claim 17 (Previously Presented): The channel estimation method as claimed in claim 15, wherein said generating the tentative data decision information symbol includes an error correction process for error correction decoding said tentative data decision information symbols implementing an error correction encoding again.

Claim 18 (Previously Presented): The channel estimation method as claimed in claim 15, wherein said generating the tentative data decision information symbol includes a weighting process for weighting said tentative data decision information symbols after the error correction encoding according to a reliability.

Claims 19-20 (Cancelled).

Claim 21 (Previously Presented): The communication device as claimed in claim 25, further comprising:

a first channel estimation part configured to estimate a channel variation after a first path search by said first path search part; and

a second channel estimation part configured to estimate a channel variation using information symbols derived from a signal demodulated according to said timings detected in the first channel estimation part and said pilot symbols of the known phase, according to the timings detected in a second path search by said second path search part.

Claim 22 (Previously Presented): The communication device as claimed in claim 21, wherein said first channel estimation part includes:

a pilot symbol acquiring part configured to acquire the pilot symbols of the known phase included in a received packet; and

a channel estimation part configured to implement a channel estimation using said acquired pilot symbols.

Claim 23 (Previously Presented): The communication device as claimed in claim 21, wherein said second channel estimation part includes:

a tentative data decision information symbol generating part configured to compensate for the channel variation in accordance with a result of a first channel estimation by said first channel estimation part, and to generate tentative data decision information symbols from the compensated information symbols; and

a channel estimation part configured to generate an information symbol that is devoid of modulation components using said tentative data decision information symbols and to implement a second channel estimation by said second channel estimation part using said pilot symbols and information symbols.

Claim 24 (Previously Presented): The communication device as claimed in claim 22, wherein said pilot symbol acquiring part includes:

a subcarrier acquiring part configured to acquire a plurality of subcarriers included in said reception signal; and

a pilot symbol acquiring part configured to acquire a plurality of pilot symbols of a known phase included in said plurality of subcarriers, respectively,

wherein said first and second channel estimation parts implement a channel estimation for each of said subcarriers using said plurality of pilot symbols.

Claim 25 (Currently Amended): A communication device for implementing a path search that detects ~~respective~~ timings of path components included in a signal received via a multipath propagation path, said device comprising:

a first path search part configured to detect ~~respective~~ the timings of the path components using pilot symbols of a known phase included in said signal received via the multipath propagation path; and

a second path search part configured to detect ~~respective~~ the timings of the path components using information symbols that are derived from a signal demodulated according to said timings detected in the first path search ~~step~~ part and said pilot symbols of the known phase.

Claims 26-30 (Cancelled).

Claim 31 (Previously Presented): The communication device as claimed in claim 21, wherein said second channel estimation part recursively implements a path search and a channel estimation by repeating processes of implementing a second channel estimation that estimates a channel variation by using information symbols derived from a signal, demodulated after a first channel estimation of said first channel estimation part according to said timings detected in a second path search of said second path search part and said pilot symbols thereafter implementing the second path search using information symbols derived from a signal demodulated after the second channel estimation and the pilot symbols, and implementing said second channel estimation using information symbols fed back in accordance with the timing detected in said second path search and the pilot symbols.

Claims 32-35 (Cancelled).

Claim 36 (Currently Amended): A communication device comprising:

a path search and channel estimation part configured to carry out at least one of a path search and a channel estimation using pilot symbols of a known phase included in a signal received via a multipath propagation path and information symbols; and

a feedback part configured to feed back said information symbols,

wherein said path search and channel estimation part recursively implements the path search and the channel estimation by repeating processes of implementing a path search using information symbols that are decoded after a channel estimation and the pilot symbols and implementing a channel estimation using the information symbols that are fed back via said feedback part in accordance with a timing detected in said path search and the pilot symbols.

Claim 37 (Previously Presented): The channel estimation method as claimed in claim 6, wherein said first channel estimation step includes:

acquiring the pilot symbols of the known phase included in a received packet; and

implementing a first channel estimation using the acquired pilot symbols.